Three-Dimensional (3d) Scanning for Soldier System Development: Keeping the Soldier in Soldier-Centric Design

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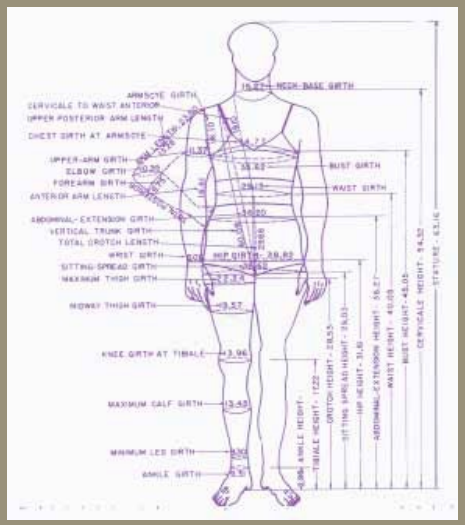
The Science Behind the Warrior:

Yesterday, Today and

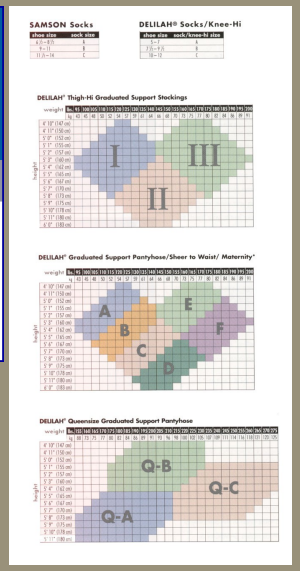
Putting the Soldier into Soldier-Centered Design

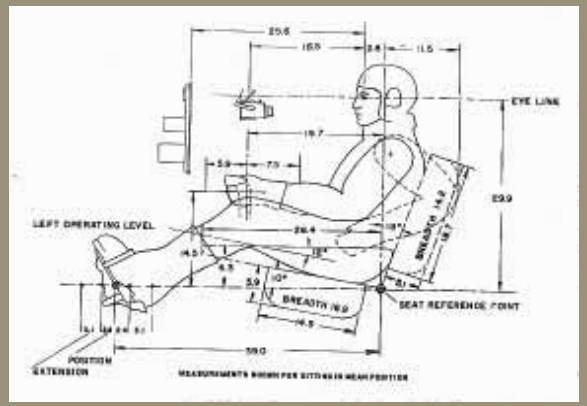
- **Space?**

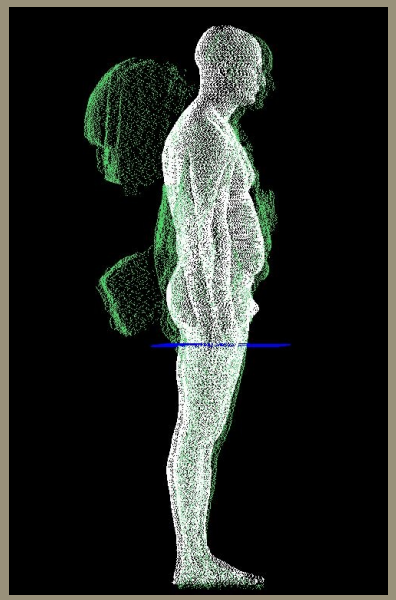


- **Sizes?**

Harbinger
HARBINGER GLOVES
SIZING CHART
Measure the circumference of your flat hand at the knuckles and use the chart below:
7"-7.5"
7.5"-8"
8"-8.5"
8.5"-9.5"
S
M
L
XL
Our gloves are generally more snug-fitting than other gloves. The leather is designed to break in and stretch out over the life of the glove. If you are between two sizes, we recommend that you select the larger of the two sizes. If you prefer a looser fitting glove, we suggest that you buy one size larger than you typically wear.

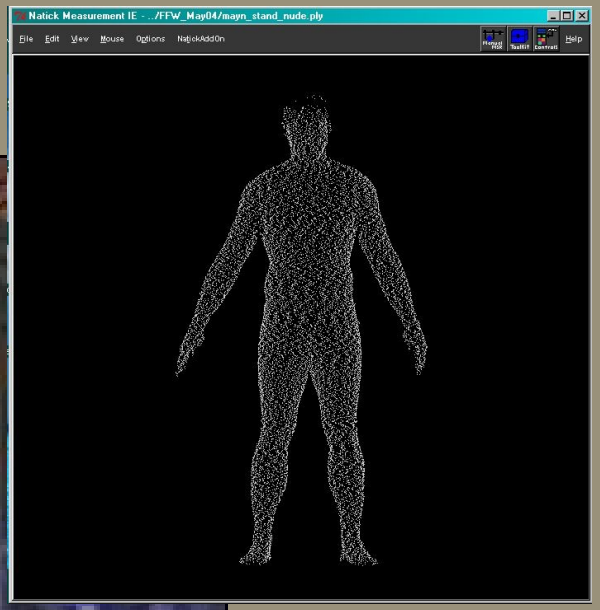






- **Integration?**

3d Scanning



Points & Texture

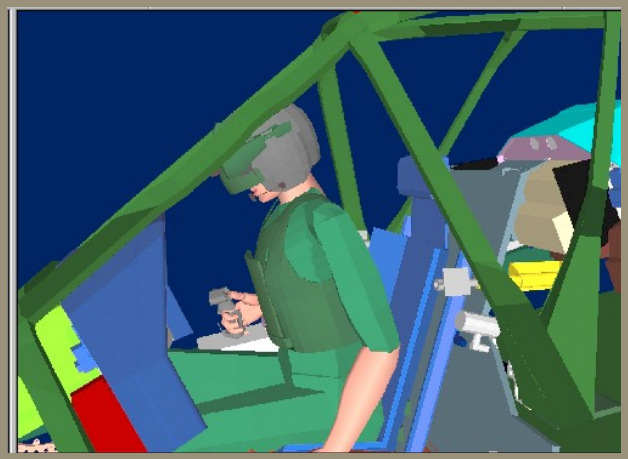
Mesh & Shade

Scan w-slices compCP

FFW Modeling for FCS Design

- **Goal- provide 3d scan data for development and validation of human figure models (Jack)**
  - Link lengths- reaches
  - Volumes- clearances

HRED/ARL



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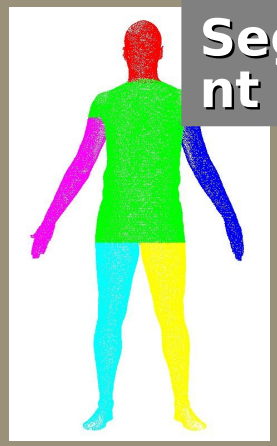
Human Figure Model Validation

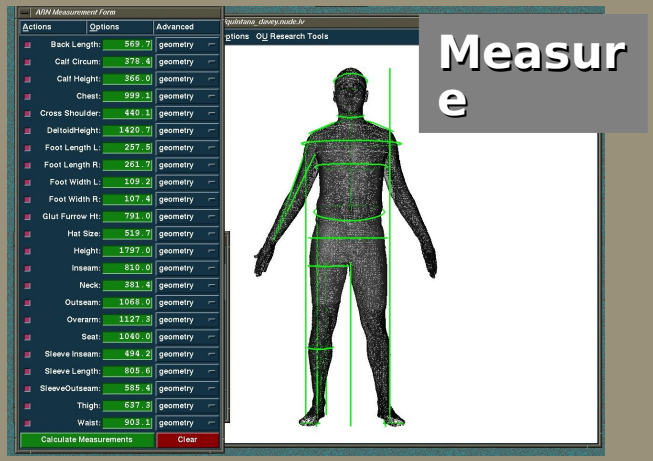
- **Obtain 3d scans of Soldier**
  - semi-nude & clothed
  - seated & standing
- **Obtain equipment models for human figure model**
  - CAD or 3d scans
- **“Clothe” human figure model**
- **Compare model to anthropometry**
- **Compare model to 3d scan**

Body Measurement

Scan

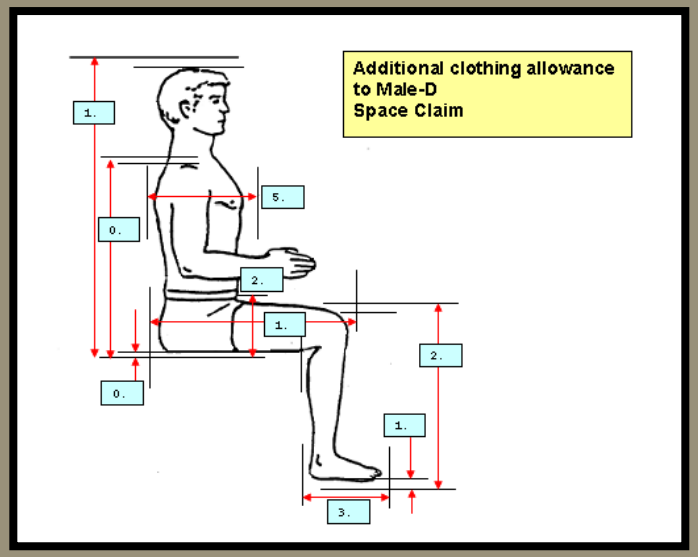


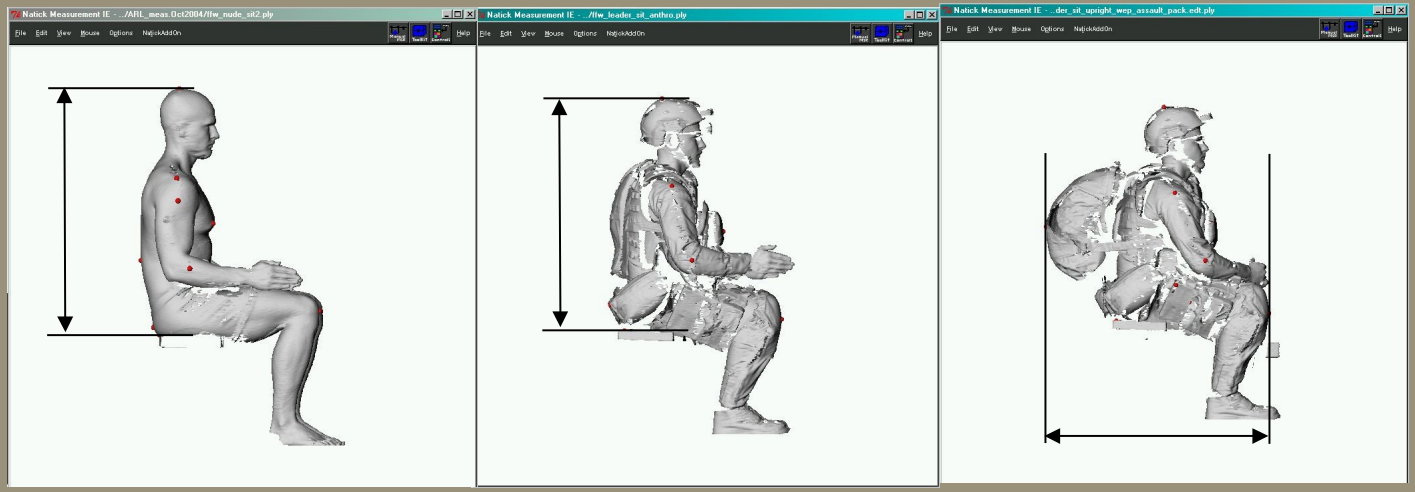
Segment



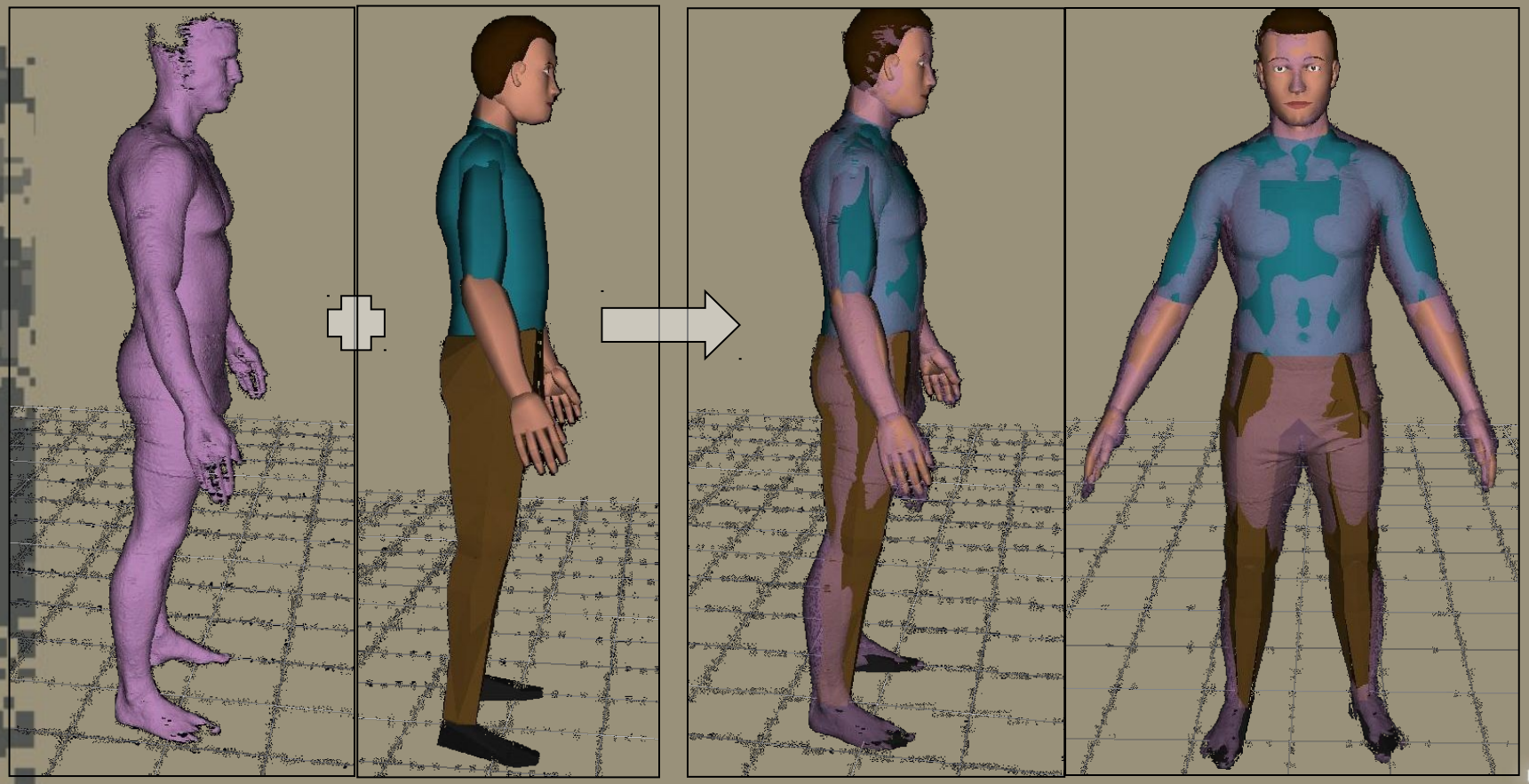
Measure

Soldier Measurement





3d Scan + Jack Model



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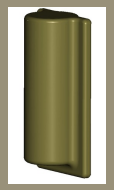
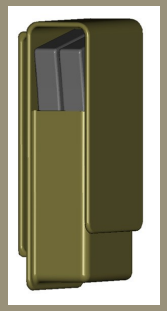
Equipment Models



HE 40 mm Grenade



Double Magazine Pouch

Chassis

Comparing Jack and Soldier

?=

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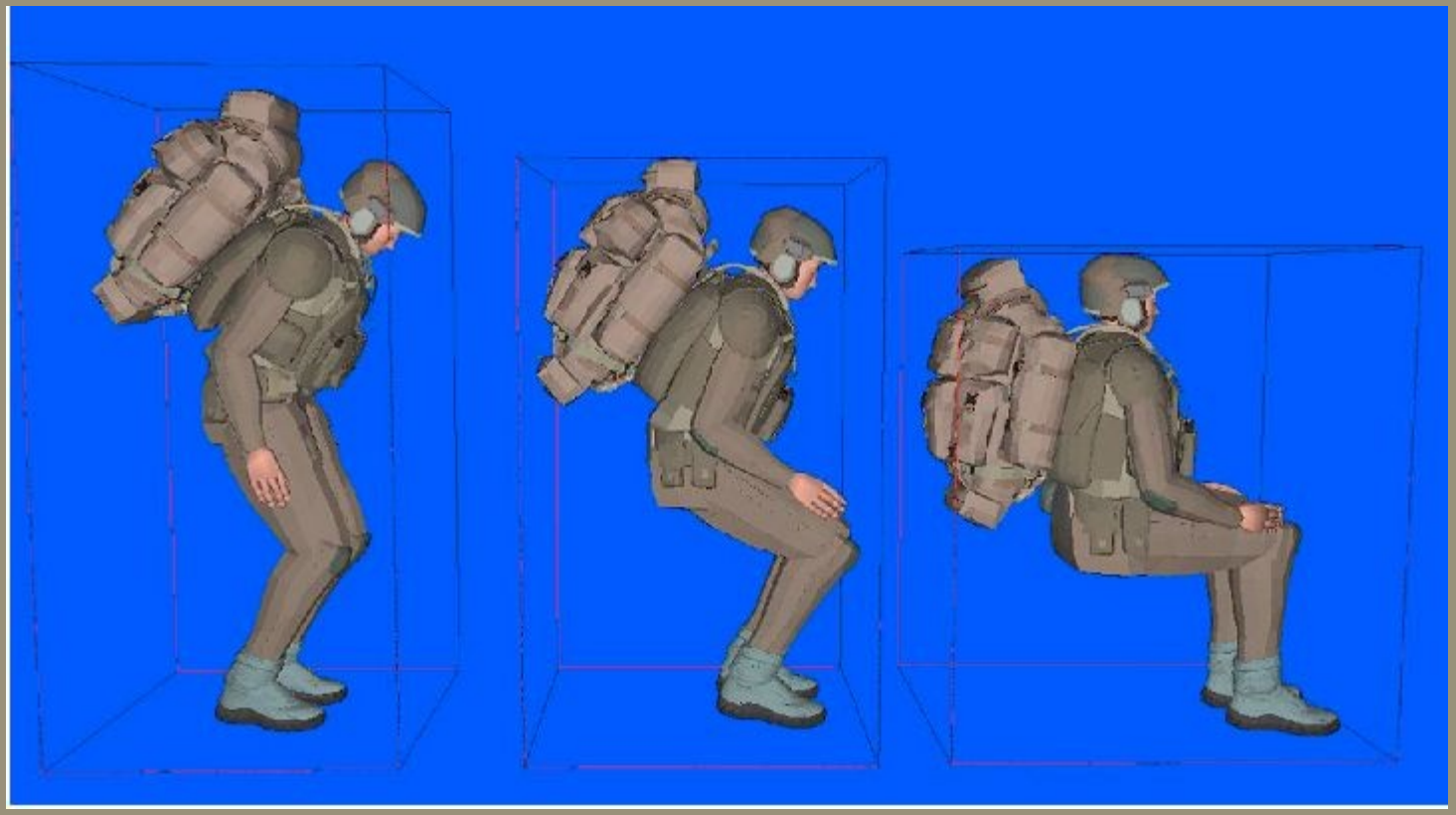
No → **Re-evaluate**

Yes → **Next phase**

Exercise Jack



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Verify Jack dimensions in new postures

Validation Summary

- Validating the size and shape of human figure models is critical to effective utilization in crew/workstation design
- Model must be validated in encumbered and unencumbered conditions
- 3d scans and direct anthropometry provide accurate data for validation and verification of human figure models
- Similar approach may be used to evaluate Soldier “real estate” for optimal distribution of equipment on the Soldier’s body

Acknowledgements

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